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PROGRESS REPORT

DEVELOPMENT OF IMPROVED BLOWOUT PREVENTION PROCEDURES TO BE USED IN DEEP WATER DRILLING OPERATIONS

**submitted to
The United States Geological Survey
Department of the Interior
Reston, Virginia**



**PETROLEUM ENGINEERING DEPARTMENT
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OCTOBER 1979

PROGRESS REPORT

July 23, 1979 - October 23, 1979

Development of Improved Blowout Prevention
Procedures for Deep Water Drilling Operations

Contract No. 14-08-0001-17225
Effective Date: August 23, 1978
Expiration Date: November 20, 1979
Funded Amount - \$90,785

Sponsored by
The United States Geological Survey
The Department of Interior
Reston, Virginia

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RESEARCH OBJECTIVES

A number of new blowout control problems are associated with moving into deep water drilling operations with floating drilling vessels. These problems become much more severe as the water depth increased, because of the increased length of the marine riser and subsea flowlines and the increased susceptibility of shallow formations to fracture. The primary objectives of the proposed research are the development of improved well control procedures to be used in deep water, floating drilling operations.

The overall research project being undertaken is the development of improved shut-in procedures, pump start-up procedures, and procedures for more safely circulating formation gas to the surface. In addition, an improved mathematical model of the well control process is being developed which will allow an accurate prediction of well behavior for various assumed operating procedures. An existing \$750,000.00 blowout control training well facility is being modified to accomplish these objectives.

The overall research plan was divided into eight tasks which would take approximately four years for completion. The initial project funding received under the present contract was \$90,785 for a fourteen month period to perform Tasks 1a, 1b, 4a, and 4b. These tasks include:

<u>Task</u>	<u>Description</u>
1	Design of a well for accurately

modeling blowout control operations on a floating drilling vessel in deep water.

a. Well scaling and design.

b. Preparation of bids and specifications.

4. Experimental study of shut-in procedures for blowout control on floating drilling vessels in deep water.

a. Experimental determination of frictional area coefficient profile of modern adjustable chokes and HCR valves used in blowout control operations.

b. Experimental determination of frictional area coefficient profile of modern annular blowout preventers during closure.

ACCOMPLISHMENTS

Tasks 1a and 1b have been essentially completed. The

experimental work for Task 4a is continuing. Data for several different mud viscosities have been collected on three different choke designs.

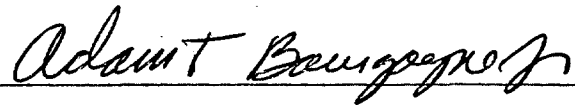
PROBLEMS

1. The fabricated annular blowout preventer test stand needed to complete Task 4b has not yet been received from NL-shaffer. This will delay completion of this phase of the project beyond November 20, 1979.

2. First attempts at mathematically modelling choke characteristics have not resulted in good agreement with our experimental data. More complex mathematical approaches are now being explored.

CHANGES

No significant changes have been made in the project since our last progress report.



Adam T. Bourgoyne, Jr., Chairman
Petroleum Engineering Department